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New technical concepts for velocity map imaging in a THz streak camera

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In this dissertation the development of a novel type of streak camera enabling multi-dimensional electron spectroscopy implying energy, angular as well as time resolution is presented. The new setup is based on a velocity map imaging (VMI) spectrometer in collinear geometry for electron spectroscopy and Terahertz streaking adding time resolution to the setup. A highly efficient detection scheme being operational at comparably bad vacuum conditions allows for highest target densities upto $3 \times 10^{22} \text{ m}^{-3}$ making the setup particularly suited for low photon flux laboratory sources. The detection efficiency is explicitly calculated. In the proof of principle experiment xenon 4d photoelectrons are streaked and the ionizing and streaking pulses are characterized.

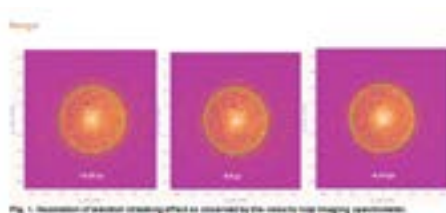


Figure 1: Illustration of electron streaking effect as observed by the velocity map imaging spectrometer

Biography

Mamuna Anwar has expertise in time resolved studies of Atomic and Molecular Physics. She got her Masters from University of Jena, Germany and PhD from University of Hamburg, Germany.

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